

Application No. 10/563,802
Response to Office Action of January 29, 2007

Patent
Attorney Docket No. 86403-3

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AMENDMENTS TO THE CLAIMS

Please find below a listing of claims that will replace all prior versions, and listings, of claims in the present patent application:

1. – 16. (cancelled)

17. (currently amended) A ground vehicle ~~including~~ comprising a device for interacting with a fluid moving relative to said device, said device comprising:

- a body characterized by an axis of rotation and having a periphery, said body being rotatable about said axis of rotation;
- a plurality of vanes associated with said body, each one of said plurality of vanes being movable between an extended position relative to said periphery and a retracted position relative to said periphery; and
- a control mechanism coupled to said plurality of vanes for selectively moving each one of said plurality of vanes between said extended position and said retracted position during rotation of said body.

18. (currently amended) A ground vehicle as defined in claim 17, wherein said control mechanism is operative to selectively move each one of said plurality of vanes such that a first vane of said plurality of vanes moves from said extended position into said retracted position and a second vane of said plurality of vanes concurrently moves from said retracted position into said extended position.

19. – 21. (cancelled)

22. (currently amended) A ground vehicle as defined in claim 17, wherein said control mechanism is operative to selectively move each one of said plurality of vanes such that each particular vane is in said extended position when a tangential velocity of said particular vane is at a first angle to a freestream direction of movement of the fluid relative to said device, and is in said retracted position when the tangential velocity of said particular vane is at a second angle to the freestream direction of movement of the fluid relative to said device, said first angle being in the range of

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about 75° to about 105° and said second angle being in the range of about -15° to about 15°.

23. (currently amended) A ground vehicle as defined in claim 17, wherein said control mechanism is operative to selectively move each one of said plurality of vanes such that each particular vane is in said retracted position when a tangential velocity of said particular vane is directed against a freestream direction of movement of the fluid relative to said device.
24. (currently amended) A ground vehicle as defined in claim 17, wherein each one of said plurality of vanes is movable between said extended position and said retracted position via a slot provided in said periphery of said body.
25. (currently amended) A ground vehicle as defined in claim 17, wherein each one of said plurality of vanes includes a plurality of telescoping elements such that each particular vane is telescopically movable between said extended position and said retracted position.
26. (currently amended) A ground vehicle as defined in claim 17, wherein each one of said plurality of vanes is capable of winding and unwinding such that each particular vane is movable between said extended position and said retracted position by unwinding and winding said particular vane.
27. (currently amended) A ground vehicle as defined in claim 17, wherein said control mechanism includes a mechanical linkage interacting with said plurality of vanes for selectively moving each one of said plurality of vanes between said extended position and said retracted position during rotation of said body.
28. (currently amended) A ground vehicle as defined in claim 17, wherein said control mechanism includes:
 - a plurality of actuators, each one of said plurality of actuators being connected to a respective vane of said plurality of vanes and being adapted

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- to move said respective vane between said extended position and said retracted position; and
- a controller coupled to said plurality of actuators, said controller being adapted to selectively activate or deactivate each one of said plurality of actuators.
29. (currently amended) A ground vehicle as defined in claim 17, said device further comprising a transmission mechanism associated with said body for transmitting energy associated with rotation of said body to a remote device in said ground vehicle.
30. (currently amended) A ground vehicle as defined in claim 29, wherein said transmission mechanism includes a shaft connected to said body and to said remote device.
31. (currently amended) A ground vehicle as defined in claim 29, wherein said remote device is operative to convert the energy associated with rotation of said body into mechanical or electrical energy.
32. (currently amended) A ground vehicle as defined in claim 31, wherein said remote device is one of a motor, a battery charger, and an electricity generator.
33. (cancelled)
34. (currently amended) A ground vehicle as defined in claim 17, wherein said control mechanism is operative for selectively moving each one of said plurality of vanes between said extended position and said retracted position during rotation of said body without increasing a total frontal area of said ground vehicle.
35. (currently amended) A ground vehicle as defined in claim 17, wherein said control mechanism is operative for selectively moving each one of said plurality of vanes between said extended position and said retracted position such as to generate less

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drag on said ground vehicle than if said device was omitted from said ground vehicle.

36. (cancelled)
37. (currently amended) A ground vehicle as defined in claim 17, wherein, when said ground vehicle is braking, said control mechanism is operative for selectively moving each one of said plurality of vanes between said extended position and said retracted position so as to generate a larger drag on said ground vehicle than when said ground vehicle is not braking.
38. (currently amended) A ground vehicle as defined in claim 17, wherein, when said ground vehicle is braking, said device is operative for rotating said body about said axis of rotation in a certain direction so as to generate a downward lift force on said ground vehicle and said control mechanism is operative for selectively moving each one of said plurality of vanes between said extended position and said retracted position so as to generate a larger drag on said ground vehicle than when said ground vehicle is not braking.
39. – 41. (cancelled)
42. (currently amended) A ground vehicle as defined in claim 17, wherein said device is located at a rear portion of said ground vehicle.
43. (currently amended) A ground vehicle as defined in claim 17, wherein said device is located at a front portion of said ground vehicle.
44. (cancelled)
45. (new) A vehicle comprising a device for interacting with a fluid moving relative to said device, said device comprising:
- a body characterized by an axis of rotation and having a periphery, said body being rotatable about said axis of rotation;

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- a plurality of vanes associated with said body, each one of said plurality of vanes being movable between an extended position relative to said periphery and a retracted position relative to said periphery;
 - a control mechanism coupled to said plurality of vanes for selectively moving each one of said plurality of vanes between said extended position and said retracted position during rotation of said body; and
 - a transmission mechanism associated with said body for transmitting energy associated with rotation of said body to a remote device in said vehicle.
46. (new) A vehicle as defined in claim 45, wherein said transmission mechanism includes a shaft connected to said body and to said remote device.
47. (new) A vehicle as defined in claim 45, wherein said remote device is operative to convert the energy associated with rotation of said body into mechanical or electrical energy.
48. (new) A vehicle as defined in claim 47, wherein said remote device is one of a motor, a battery charger, and an electricity generator.
49. (new) A vehicle as defined in claim 45, wherein said control mechanism is operative for selectively moving each one of said plurality of vanes between said extended position and said retracted position during rotation of said body without increasing a total frontal area of said vehicle.
50. (new) A vehicle as defined in claim 45, wherein said control mechanism is operative for selectively moving each one of said plurality of vanes between said extended position and said retracted position such as to generate less drag on said vehicle than if said device was omitted from said vehicle.
51. (new) A vehicle as defined in claim 45, wherein, when said vehicle is decelerating, said control mechanism is operative for selectively moving each one of said plurality of vanes between said extended position and said retracted position so as to generate a larger drag on said vehicle than when said vehicle is not decelerating.

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52. (new) A vehicle comprising a device for interacting with a fluid moving relative to said device, said device comprising:
- a body characterized by an axis of rotation and having a periphery, said body being rotatable about said axis of rotation;
 - a plurality of vanes associated with said body, each one of said plurality of vanes being movable between an extended position relative to said periphery and a retracted position relative to said periphery; and
 - a control mechanism coupled to said plurality of vanes for selectively moving each one of said plurality of vanes between said extended position and said retracted position during rotation of said body, said control mechanism being operative for selectively moving each one of said plurality of vanes between said extended position and said retracted position such as to generate less drag on said vehicle than if said device was omitted from said vehicle.
53. (new) A vehicle as defined in claim 52, wherein said control mechanism is operative for selectively moving each one of said plurality of vanes between said extended position and said retracted position during rotation of said body without increasing a total frontal area of said vehicle.